

AMENDMENTS TO THE CLAIMS

1. (Original) An apparatus for transmitting a sequence for channel estimation in a mobile communication system including M transmission antennas, P encoders for receiving P information bit streams and encoding the received P information bit streams with a space-time trellis code (STTC), and M modulators for modulating information bit streams output from the P encoders in a predetermined modulation scheme and outputting modulation symbol streams, the apparatus comprising:

a sequence generator for generating the sequence for the channel estimation;

M puncturers for puncturing at least one modulation symbol in a predetermined position for each of the modulation symbol streams output from the M modulators; and

M multiplexers individually connected to the M transmission antennas, for multiplexing signals output from the M puncturers and the sequence inserted in the punctured modulation symbol.

2. (Original) The apparatus of claim 1, wherein the M puncturers each have a same number of modulation symbols where the sequence is inserted, for the modulation symbol streams output from the M modulators.

3. (Original) The apparatus of claim 1, wherein the M puncturers each periodically repeat a position where the sequence is inserted, for the modulation symbol streams output from the M modulators.

4. (Original) The apparatus of claim 1, wherein the sequence is a pilot sequence.

5. (Original) The apparatus of claim 4, wherein a frame format transmitted through each of the M transmission antennas is set so that the M transmission antennas have different positions where the pilot sequence is inserted.

6. (Original) The apparatus of claim 1, wherein if M is 2 and a number of symbols constituting the modulation symbol stream is 4, a position where the sequence is inserted is determined according to a puncturing matrix P_1 defined as

$$P_1 = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \end{bmatrix}$$

wherein a column corresponds to a transmission period, a row corresponds to a transmission antenna, and the sequence is inserted in a position of an element "0."

7. (Original) The apparatus of claim 1, wherein if M is 2 and a number of symbols constituting the modulation symbol stream is 6, a position where the sequence is inserted is determined according to a puncturing matrix P_2 defined as

$$P_2 = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 1 \end{bmatrix}$$

wherein a column corresponds to a transmission period, a row corresponds to a transmission antenna, and the sequence is inserted in a position of an element "0."

8. (Original) A method for transmitting a sequence for channel estimation in a mobile communication system including M transmission antennas, P encoders for receiving P information bit streams and encoding the received P information bit streams with a space-time trellis code (STTC), and M modulators for modulating information bit streams output from the P encoders in a predetermined modulation scheme and outputting modulation symbol streams, the method comprising the steps of:

generating the sequence for the channel estimation; and

transmitting the sequence in substitute for at least one modulation symbol in a predetermined position through the M transmission antennas, for each of the modulation symbol streams output from the M modulators.

9. (Original) The method of claim 8, wherein number of sequences inserted in modulation symbol streams output from the M modulators are identical.

10. (Original) The method of claim 8, wherein the predetermined position where the sequence is inserted is periodically repeated for modulation symbol streams output from the M modulators.

11. (Original) The method of claim 8, wherein the sequence is a pilot sequence.

12. (Original) The method of claim 8, wherein if M is 2 and a number of symbols constituting the modulation symbol stream is 4, the predetermined position where the sequence is inserted is determined according to a puncturing matrix P_1 defined as

$$P_1 = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \end{bmatrix}$$

wherein a column corresponds to a transmission period, a row corresponds to a transmission antenna, and the sequence is inserted in a position of an element "0."

13-20. (Cancelled)